DOCUMENT RESUME

ED 061 969 LI 003 639

AUTHOR Price, Douglas S.
TITLE Real Costs for Information Managers.
PUB DATE 72
NOTE 25p.;(0 References); Keynote Address, National Library Week Symposium III. April 20-21, 1972, Minneapolis, Minn., sponsored by the Minnesota Chapters of Special Libraries Assoc., American Society for Information Science

EDRS PRICE MF-$0.65 HC-$3.29
DESCRIPTORS *Cost Effectiveness; *Costs; *Information Systems; *Management; Speeches; Unit Costs
IDENTIFIERS *Building Block Cost Analysis

ABSTRACT

Management of an information function requires detailed knowledge of what is being spent, how it is spent, and what is received in return for the money. Simply knowing whether a profit has been made or a loss suffered, and even knowing how expenditures were distributed, is not enough information for management. Building block cost analysis is designed to provide the information system manager with precisely the information he needs to manage. This theory is based upon two premises. First, the most effective display of information systems costs is in terms of unit costs. One production count, however, is not a useful measure of an entire information system. The system must be broken down into subunits which can be unit costed, and then added together for the total cost. Second, unit costs are meaningful only in a framework which includes all costs of the system. The example used to illustrate building block cost analysis is an information activity which collects a series of reports, prepares surrogates, enters them into a computer system, and produces a monthly abstract journal. (Author/SJ)

ED 061969

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY.

Real Costs for Information Managers

by

Douglas S. Price, Deputy Director

ERIC Processing and Reference Facility

Keynote Address

National Library Week Symposium III

April 20 - 21, 1972

Minneapolis, Minnesota

Sponsored by the Minnesota Chapters

of

Special Libraries Association

American Society for Information Science

LI 003 639

LIST OF FIGURES*

NO.	DESCRIPTION	FOLLOWS PAGE
None	Gross Unit Cost	3
1	Example of Building Block Assembly	3
2	Building Block Assembly	4
3	Building Block Assembly	4
6	Summary Report Format (Simplified)	4
9	Input Products	6
10	Functional Labor Costs	7
11	Input Allocations	10
12	Output Products	13

*These figures were extracted from a longer work. The numbers were not changed.

Good morning.

Several weeks ago, I read something which strikes me as being the perfect keynote statement for this symposium. It is simply this: "A manager who doesn't know his costs is no manager at all." John Wilson said that in his chapter on costs for the next volume of the Annual Review. I doubt if many people would take issue with his position as stat .fter all, we all know how much we have spent and what revenues or budget allocation we had to work with, so we know whether we are in the black or the red. But is this enough? Even if we know how our expenditures were distributed among labor, overhead, materials, services, and facilities, do we have enough information to manage? I submit that we do not. Management of an information function requires much more detailed knowledge of what we are spending, how, and what we are getting for our money. This may seem like another obvious statement, but the question of how we collect this detailed information and put it together in a meaningful, useful fashion is not so obvious. Because of the variations in our workloads, the idea of unit costing is very attractive, but unit costs -- in themselves -- are not necessarily more meaningful. In fact, they can be quite misleading. The most common method of determining unit costs in the past has been to divide total expenditures by the number of documents processed. Surely, this gives you a unit cost, but is it any more meaningful than the budget figures? Suppose you spent $450,000 in one year and processed 12,000 documents, so your unit cost was $37.50. What information does this figure provide as a basis for management action? In a word, none. There is no structure or detail to the number.

Of course, you can go to the other extreme and send someone out into the shop with a stop watch to time all the functions, multiply by rates, and get all the structure you want. But, again, is this information useful? What

TOTAL COST $449,400

ACCESSIONS PROCESSED 12,000

UNIT COST $37.45

about nonproductive time? And non-labor costs? And the manager? Are you going to time him? Besides, who do you know who can work normally when someone is standing over him with a stop watch?

The use of numbers obtained by either method for management decisions is fraught with risk. In the first case, there isn't enough detail, and in the second, the costs are unlikely to be either accurate or complete. But, in order to manage an information function intelligently, the manager must have the complete picture, and it must be an intelligible picture, with enough structure and detail to permit him to zero in on the real problems. Is there a way to give him this? The answer is, yes.

Over the last six or seven years, a system for building block cost analysis of information systems has been developed. This system -- which incidentally, is new only in its application to information systems -- is designed to provide the information system manager with precisely the information he needs to manage.

Building block costing rests on a couple of basic premises which we should examine --

First, the most effective display of information systems costs is in terms of unit costs. However, it must be recognized that -- in the real world -- it is highly unlikely that a single production count is going to be a useful measure of an entire information system. What you have to do is attempt to break the system up into smaller subunits, each of which is measurable by a single, coherent, countable unit of production. These are then individually unit costed by collecting real costs and real production over a period of time. To find the cost of an end item or deliverable article, you take the appropriate number of each kind of subunit that went into the end item, multiply each by its unit cost and add these together.

Analagous situations exist in the automobile and aircraft industries, where --

I am told -- they can deliver a whole year's production with no two vehicles or aircraft being exactly alike. A given airframe, for instance, may be equipped with varying proportions of first and coach class seats; a cargo framework; or fuel tanks, while a given seat design may be used in any number of different airframes.

The second premise is that unit costs are meaningful only in a framework which includes all costs of the sytem. Since some information system activities are inherently incapable of being unit costed, this means some method of distribution or allocation has to be applied. Accomplishing this on a rational basis takes some doing.

At this point, let me show you an example of building block cost analysis and how it can help you manage.

Oversimplifying for the purposes of illustration, let us assume an information activity which: collects a series of reports, many of which have author abstracts; prepares surrogates; enters them into a computer system; and produces a monthly abstract journal, in which the abstract section is photocomposed and the indexes are produced on a chain printer. Printing is by offset. Ignoring for the moment other uses to which the computer file may be put, let's assume that he spends $449,400 per year and processes 12,000 accessions through the system. This works out to a unit cost per accession of $37.45. Looking at this figure in isolation, a manager might well decide that processing is costing too much and try to crack the whip over his people to get more production; or cut down on the quality or size of abstracts to get the cost down.

However, building block cost analysis would provide him with information something like Figure 1. As you can see there are five building blocks which make up this simplified system. Each issue has 700 accessions with author abstracts, and 300 for which abstracts had to be prepared. This results in 150 photocomposed pages for the abstract section and 200 computer printer pages of

	PER ISSUE	ANNUAL 12 ISSUES
700 ACCESSIONS TO FILE, WITH AUTHOR ABSTRACTS @ $8.00	$ 5,600	$ 67,200
300 ACCESSIONS TO FILE, IN-HOUSE ABSTRACTS @ $15.00	4,500	54,000
150 PHOTOCOMPOSED PAGES @ $5.00	750	9,000
200 CHAIN PRINTER PAGES @ $1.75	350	4,200
1,750,000 PAGES REPRODUCED (350 x 5,000 COPIES) @ $15.00 PER 1,000	26,250	315,000
	$ 37,450	$ 449,400

WITH 4,500 PAID SUBSCRIPTIONS, ANNUAL COST PER SUBSCRIPTION = $99.87

AVERAGE COST PER ACCESSION = $37.45

FIGURE 1. EXAMPLE OF BUILDING BLOCK ASSEMBLY

indexes. A 5,000-copy print run gives us close to 2 million pages per issue for printing. The cost per issue and the annual cost are shown. Note that the average cost per accession is still $37.45. We also show the average cost per paid subscription. You can see from the unit costs that in-house abstracting adds $7.00 per item to 30% of the thruput. If you assume brilliant methods analysis and a heroic training effort (both of which will cost money), you might be able to reduce the added cost to $4.00 without damaging the quality too badly. This would save you $3.00 per item abstracted, $900.00 per issue, and $10,800 per year, which just might defray the cost of the analysis and training.

On the other hand, look at the print run -- 5,000 copies, but only 4500 paid subscriptions. Do you really need 500 extra copies? By cutting the overrun to 250 copies, you can, at virtually no cost, reduce your costs by over $1,300.00 per issue and nearly $16,000.00 per year. (See Figure 2). Or take another tack. Photocomposition of the indexes can conservatively reduce the number of pages in the indexes by one-third. Suppose you spent $25,000.00 for programming to photocompose the indexes. You will have increased your per issue page preparation costs by $320.00, but will have reduced your printing costs by $4703.00 per issue for a net savings of $4383.00 per issue. Over the year, this amounts to a saving of over $50,000.00 (See Figure 3) for a net in the first year of more than the investment in programming. Note also, that by these two actions we have reduced the average unit cost by $5.69 without touching the input processing cost!

You can see how valuable this kind of display would be to a manager, but what I have shown you so far has been out of context, so let's try to put it back into context so I can show you how these numbers are obtained.

Figure 6 is a greatly simplified sample of a summary report. An actual report would have a great many more lines and columns. I have a sample of an actual report here, but you can see that if I tried to put it on the screen, you wouldn't be able to read it. However, this will establish the pattern, and we

	PER ISSUE	ANNUAL 12 ISSUES
700 ACCESSIONS TO FILE, WITH AUTHOR ABSTRACTS @ $8.00	5,600	67,200
300 ACCESSIONS TO FILE, IN-HOUSE ABSTRACTS @ $15.00	4,500	54,000
150 PHOTOCOMPOSED PAGES @ $5.00	750	9,000
200 CHAIN PRINTER PAGES @ $1.75	350	4,200
1,662,500 PAGES REPRODUCED (350 x 4,750 COPIES) @ $15.00 PER 1,000	24,938	299,256
TOTAL	$ 36,138	$ 433,656
SAVINGS OVER FIGURE 1:	$ 1,312	$ 15,744

WITH 4,500 PAID SUBSCRIPTIONS, ANNUAL COST PER SUBSCRIPTION = $96.37

AVERAGE COST PER ACCESSION = $36.14

FIGURE 2. BUILDING BLOCK ASSEMBLY

	PER ISSUE	ANNUAL 12 ISSUES
700 ACCESSIONS TO FILE, WITH AUTHOR ABSTRACTS @ $8.00	5,600	67,200
300 ACCESSIONS TO FILE, IN-HOUSE ABSTRACTS @ $15.00	4,500	54,000
284 PHOTOCOMPOSED PAGES @ $5.00	1,420	17,040
1,349,000 PAGES REPRODUCED (284 x 4,750 COPIES) @ $15.00 PER 1,000	20,235	242,820
TOTAL	$ 31,755	$ 381,060
SAVINGS OVER FIGURE 2	4,383	52,596
LESS EXPENSES		(25,000)
NET SAVING 1ST YEAR		27,596

WITH 4,500 PAID SUBSCRIPTIONS, ANNUAL COST PER SUBSCRIPTION = $84.68

AVERAGE COST PER ACCESSION = 31.76

FIGURE 3. BUILDING BLOCK ASSEMBLY

PROD. CLASS	DESCRIPTION	UNITS	DIRECT COSTS	INTERNAL ALLOCATIONS & TRANSFERS	SUBTOTAL	EXTERNAL BURDENS	TOTAL COSTS
	TOTAL COSTS		$125,000	$ –	$125,000	$25,000	$150,000
	GENERAL COSTS		25,000	(25,000)	–	–	–
	AD HOC ACTIVITIES		15,000	3,750	18,750	3,750	22,500
	INPUTS		30,000	7,500	37,500	7,500	45,000
	OUTPUTS		35,000	8,750	43,750	8,750	52,500
	COLLATERAL SERVICES		20,000	5,000	25,000	5,000	30,000

FIGURE 6. SUMMARY REPORT FORMAT (SIMPLIFIED)

can look at some of the details later.

The first column headings are fairly straightforward. Product Class simply provides a place to identify each line entry by the tag(s) used to collect its costs, and Description is self-explanatory. Units would not be applicable to the line entries shown, but would be an essential for any line entry where you are calculating unit costs. Direct Costs would, in a real report, certainly be shown in more detail -- at least to the level of Direct Labor, Fringe, and Other Direct Costs, with a subtotal. Note that Fringe (i.e., Vacation, Holiday, Pension, Insurance, etc.) which is a kind of burden, is included here among direct costs. This is because unlike most other burdens, it really is a percentage of the base against which it is applied. The division of Other Direct Costs into its components would be determined by your situation. If you had heavy computer involvement, you would probably want to show this as a separate column. Similarly, Printing or a large subcontract affecting a number of products might also be separately displayed.

Internal Allocations & Transfers represents the distribution of costs which cannot be directly associated with production. In this simplified report, we have simply allocated General Costs across the other costs on the basis of total direct costs shown in the previous column.

Turning our attention now to the lines, we encounter the crux of this report, the Total Costs line, which must show class by class, every dollar spent during the period being reported. The only other point to note is that the total for the allocations columns will always be zero; they do not change total costs, only redistribute them.

The remainder of the lines we show here would appear as subtotals, if at all, on a real report. What I have chosen to show here are the five general categories of activities which are typical of information systems. Let's look at these for a moment.

General Costs are the essentially fIxed costs of operating an information system, and would include such things as the manager and his staff, rent, utilities, etc. They would also include the costs of system development and maintenance, including computer programming, if you use a computer.

Ad Hoc Efforts - Include the innumerable special studies and tasks with which almost any information operation is deluged over the course of a year. Usually, these get buried in the burdens, but they should be separately identified, if only to show management how useful you are.

Inputs - Include all the activities which are concerned with building a base and maintaining it, e.g. Acquisitioning, Cataloging, Abstracting, Indexing, Update, etc.

Outputs - Include all the activities which draw on the data base to produce products for sale or delivery to the customer(s), e.g. Publications, Indexes, Searches, SDI, etc.

Collateral Services - Include activities which are "spin-offs" from the input/output activities, but are not necessarily dependent on them, e.g. producing microfiche of the documents or duplicating copies on request.

The significance of these categories lies in the fact that a valid building block activity will be wholly contained within one -- and only one -- of them. Further, while Inputs, Outputs, and Collateral Services can usually be unit costed, Burdens cannot, in and of themselves be unitized. However, to display real costs, they must be incorporated into the unit costs, usually by a process of allocation. The treatment of Ad Hoc Efforts will vary depending upon the organization. In a service center, they should be displayed separately, and carry a share of Burden costs. In a commercial operation, they would ultimately have to be included in the burden, but provision should be made for separate display

so that the extent of such activities can be measured and, if appropriate, changed

Let's go down to Inputs and look at these in some detail as illustrative of how the building block costs are arrived at. Figure 9 shows a possible set of Input products. This is probably more detail than you would normally use, but I need all of these to illustrate some points about the building block concept.

Figure 9 also displays for each product by cost element, the total cost for the period and, except for Acquisitions, a unit cost which is obtained by dividing the dollar cost for the element by the units shown in the Units column of the report. This juxtaposition enables the manager to assess both the unit cost and the dollar impact at a glance.

Let's look at the products I have chosen to represent here. Acquisitions is not unit costed for several reasons. Primarily this is because there is little value in an average unit cost for this activity. On one hand, the attempt to acquisition a single document may require considerable research and several follow-up letters, with ultimate failure. On the other, a single form letter or coupon may result in the acquisition of many documents. Also, there may be -- and usually is -- a considerable time lag between the exertion of the effort and the response. Add to this the difficulty of distinguishing between documents which arrive as a result of acquisitions effort and those which arrive because people know you exist, and you have a hopeless situation. You can eventually arrive at a unit cost of sorts, but we will get to that later.

Receiving and Input, however, is a readily measurable function. Since this is all of the activities from the point the document hits your receiving station through the decision to process it in a certain way, this is readily measurable by a count of the incoming documents. Note that in the example, the number of units is greater than the total number of accessions to file. This illustrates the point that processing duplicates and rejects also costs money. The valid measure of this effort is not how many accessions may eventually be added to

DESCRIPTION	UNITS	DIRECT LABOR	FRINGE	COMPUTER USAGE	OTHER DIRECT COSTS	TOTAL DIRECT COSTS
ACQUISITIONS	N.A.	$20,000	$4,000	–	$2,000	$26,000
RECEIVING & INPUT	26,000 DOCUMENTS	52,000 2.00	10,400 0.40	– –	15,600 0.60	78,000 3.00
ACCESSIONS TO FILE						
a. CLASS A - ANNOUNCED	12,000 ACCESSIONS	117,000 9.75	23,400 1.95	21,000 1.75	18,600 1.55	180,000 15.00
b. CLASS B - INDEXED	5,000 ACCESSIONS	31,000 6.20	6,200 1.24	6,250 1.25	6,550 1.31	50,000 10.00
c. CLASS C - CATALOGED	2,000 ACCESSIONS	7,200 3.60	1,440 0.72	2,000 1.00	1,360 0.68	12,000 6.00
AUTHORITY FILE UPDATES						
a. INDEXING VOCABULARY	120 TERMS	1,800 15.00	360 3.00	720 6.00	120 1.00	3,000 25.00
b. CORPORATE SOURCES	240 SOURCES	1,200 5.00	240 1.00	720 3.00	240 1.00	2,400 10.00

FIGURE 9. INPUT PRODUCTS

the file, but how many documents have to be processed through these operations.

Under Accessions to File, we have three substantially different kinds of Inputs. Class A is presumed to be current significant material which warrants announcement in an abstract journal and perhaps SDI treatment. The announcement will include cataloging data, an abstract, and indexing for both publication and machine retrieval. Class B is older or less significant material, which is entered into the system only for machine retrieval. It is catalogued and indexed only. Class C is administrative material which is entered into the system for control purposes only. It is cataloged only.

This array is, I suspect, more complex than you would commonly encounter, but I will need the detail to illustrate some points further on.

You will note that, in Class A, I have not displayed a distinction between items which have author abstracts, and those which must be abstracted in-house. The reason for this is that, at the delivery point as Accessions to File, they are substantially indistinguishable. The only significant difference between them is the amount of labor required to get them to that point -- and that occurs only in document analysis. To illustrate this point, and show how the system can make this distinction, let's look at Figure 10 for a moment. This is a functional analysis of labor costs for each of the inputs. The first line shows the overall cost and unit cost by function for the total of Class A labor, using the total production volume of 12,000 units as the divisor. This reconciles the functional entries to the direct labor costs in Figure 9. The second line shows the functions which are common to both author and in-house abstract accessions to give a total labor unit cost of common functions of $6.25. It should be apparent that to the cataloger or the keyboard operator, for instance, it is irrelevant whether or not the item carries an author abstract. The next two lines display the overall and unit costs of the two significant functions -- Indexing and Indexing/Abstracting -- using their respective production volumes as divisors.

Description	A Production Quantity	FUNCTIONS B Cataloging 21	C Indexing 22	D Abstract Indexing 23	E Initial Edit 24	F Keying 31	G Print-Out Edit 25	H Clerical 11	I Total Direct Labor
CLASS A TOTAL	12,000	21,000 1.75	15,000 1.25	27,000 2.25	15,000 1.25	24,000 2.00	12,000 1.00	3,000 0.25	117,000 9.75
CLASS A COMMON	12,000	21,000 1.75	See Below	See Below	15,000 1.25	24,000 2.00	12,000 1.00	3,000 0.25	75,000 6.25
CLASS A INDEX AUTHOR/ABSTRACT	7,500		15,000 2.00						15,000 2.00
CLASS A INDEX AND IN-HOUSE ABSTRACT	4,500			27,000 6.00					27,000 6.00
CLASS B INDEXED	5,000	8,750 1.75	9,000 1.80		5,000 1.00	4,000 0.80	3,750 0.75	500 0.10	31,000 6.20
CLASS C CATALOGED	2,000	3,500 1.75			1,500 0.75	1,000 0.50	1,000 0.50	200 0.10	7,200 3.60

Notes: 1. The figures in column A (Quantity Produced) and column I (Total Direct Labor) are identical with column A (Quantity Produced and Units) and column B (Cirect Labor) of Sheet 1 for the corresponding Product Line Entries.

FIGURE 10. FUNCTIONAL LABOR COSTS

These yield unit costs of $2.00 and $6.00 per item respectively. Adding the common unit costs to each of these gives us labor unit costs for Author Abstract Items of $8.25 and for In-House Abstract items of $12.25. Note that we have not separated abstracting per se as a separate function. It is uneconomical to have one person review the document for the purpose of preparing an abstract and have someone else review it for the purpose of indexing -- and if you have one person doing both tasks, it is irrational to expect him to divide his time appropriately.

While we are on Figure 10, I might point out that the cataloging unit costs for all three classes are the same, since cataloging is cataloging. In the real world, these would probably not be identical, but they should track pretty closely. Class B shows indexing and editing costs somewhat below the Author Abstract items of Class A because there is no indexing for publication, and there is less material to edit. Keying, however, should be substantially lower, because the abstract will probably be more than half the volume of keying a Class A item. Class C shows no indexing, of course, and somewhat lower other costs because of this.

Returning to Figure 9, we find the Authority File Updates divided into two areas; Indexing Vocabulary; and Corporate Sources. A glance at the unit costs -- which, although imaginary, are not too unrealistic -- will show why these are separated from the straight processing and from each other. There is a secondary reason, in that the volume of these activities -- particularly, the vocabulary -- has very little relationship to the input volume. Typically, during start-up, when processing volume is relatively low, vocabulary additions are quite voluminous, but as volume increases, and the base is built, the need for additional vocabulary terms drops off quite sharply. In the example, the Indexing vocabulary is presumed to be a hierarchically-structured thesaurus, requiring the determination of broader and narrower terms, synonyms, etc., while a Corporate Source entry only requires determination that it is in fact a new source and not a variation of an

existing one, and requiring only a single line entry, with perhaps a code.

At this point, we are tracking seven different products (or classes of cost) for Inputs, but only three of these, the Accessions to File, are "deliverable" items in the sense that they are significant additions to the data base which will increase its value. The other four products only support these "deliveries". Therefore, their cost must be reflected in the final cost of the items delivered or added to the data base. This is where the allocation and transfer technique which I mentioned earlier, comes into play.

Let's look at a few of the various ways in which this can be done. I use that phrasing to remind you that allocation is inherently an arbitrary process. There is no universal "right way". Even similar situations may require different treatment in different systems. The only criteria are rationality and usefulness. Figure 11 illustrates some approaches we have found useful. To keep the process as simple as possible, the Management Allocation and the Systems Maintenance Allocation should be applied in that order before all others. The Management Allocation is the internal burden mentioned earlier and is usually applied as a percentage of Direct Costs. The factor is determined by dividing the Direct Costs of Management by the total of all other Direct Costs. In the example, this factor is 0.5 (or 50%) which is not too unrealistic if Management includes rent, utilities and maintenance costs. But look at those numbers. That Management Allocation has a terrific impact on your unit costs. If you could reduce it to 40% by, for example, dispensing with unneeded floorspace, or services, or even people -- or, of course, by increasing your base -- you would achieve the same effect on the unit cost of announced items alone as you would by eliminating in-house abstracting! Systems Maintenance (which is defined as <u>computer</u> systems maintenance) is allocated on the base of computer usage rather than Direct Costs so that it burdens only those products which make use of the computer. Remember

DESCRIPTION	UNITS	TOTAL DIRECT COSTS	ALLOCATIONS: MANAGEMENT NOTE 1	SYSTEMS MAINT. NOTE 2	ACQUISITIONS NOTE 3	INPUT NOTE 4	INDEX. VOCAB. NOTE 5	CORP. SOURCES NOTE 6	REVISED TOTAL DIRECT
ACQUISITIONS	N.A.	26,000	13,000		(39,000)				
RECEIVING AND INPUT	26,000 Docmts.	78,000 / 3.00	39,000 / 1.50			(117,000) / //4.50//			
ACCESSIONS TO FILE									
a. CLASS A - ANNOUNCED	12,000 Accessns.	180,000 / 15.00	90,000 / 7.50	4,200 / 0.35	29,008 / 2.42	73,895 / 6.16	3,278 / 0.27	2,365 / 0.20	382,746 / 31.90
b. CLASS B - INDEXED	5,000 Accessns.	50,000 / 10.00	25,000 / 5.00	1,250 / 0.25	8,058 / 1.61	30,789 / 6.16	1,366 / 0.27	985 / 0.20	117,448 / 23.49
c. CLASS C - CATALOGED	2,000 Accessns.	12,000 / 6.00	6,000 / 3.00	400 / 0.20	1,934 / 0.96	12,316 / 6.16		394 / 0.20	33,044 / 16.52
AUTHORITY FILE UPDATES									
a. INDEXING VOCABULARY	120 TERMS	3,000 / 25.00	1,500 / 12.50	144 / 1.20			(4,644) / //38.70//		
b. CORPORATE SOURCES	240 SOURCES	2,400 / 10.00	1,200 / 5.00	144 / 0.60				(3,744) / //15.60//	

NOTES:
1. (a) 50% of Total Direct
2. (a) 20% of Computer Usage
3. To Classes A.B.&C. by Total Direct
4. To Classes A.B.&C. by Volume
5. To Classes A.&B. by Volume
6. To Classes A.B.&C by Volume

FIGURE 11. INPUT ALLOCATIONS

that both of these allocations are applied across the whole system and we are looking here at only a portion, the Inputs.

With the Acquisitions allocations, we come to the specific Internal transfers for Inputs, and we can discuss some of the reasoning we have applied to specific allocations. The first thing to note is that the amount being allocated must include all previous allocations. In the example, the previous allocation to Acquisitions was the Management Allocation, so the amount to be allocated is $39,000 -- $26,000 in Direct Costs and $13,000 Management Allocation. We have chosen to allocate Acquisitions on the basis of Total Direct Costs. The allocation pool ($39,000) is divided by the sum of the Total Direct Costs of the three Accessions to File products ($242,000) to obtain a factor of 0.16. This is then applied to the Total Direct Cost of each line entry to obtain the allocation for each. This procedure applies nearly three quarters of the Acquisition cost to the Class A accessions. You could, of course, make this allocation on the basis of volume processed. In this case, you would divide the allocation pool ($39,000 by the total production (19,000) to obtain a factor (or more correctly a unit cost) of $2.053. This is then multiplied by the production figure for each line entry to obtain the dollar allocation. The unit cost would then be constant for all three Classes. This procedure reduces the burden on Class A accessions by about $4,000 and increases the other two by about $2,000 each. This is perfectly valid (i.e. conforming to the rules), but is it rational? If you remember the definitions of the classes, I think you will agree that it is not. In this particular case (and I can't emphasize that too strongly), the main thrust of Acquisitions would be to acquire the most current, most significant documents, i.e. Class A. Should we then let Class A carry the entire load? Again, no. Inevitably, there will be fall-out from the Acquisitions effort which will benefit the other two classes, so they should carry a part, albeit a small one, of the load.

The negative entry -- shown in parentheses () -- zeroes out both the line and the column to maintain the arithemetic integrity of the report.

The Input Allocation, on the other hand, is a different story. We have been showing unit costs for Receiving and Input all along, and for this operation, a document is a document, without regard to which class of accession it may become. However, the unit cost of the allocation pool (shown in brackets) is not the unit cost we use for the allocation. The new unit cost is calculated by dividing the pool by the total Accessions to File or 19,000 rather than the 26,000 documents used heretofore. This results in a higher unit cost, which distributes the cost of duplicates and rejects equitably among the accession classes.

The difference between the unit cost for the product itself and that for allocation becomes dramatic when we examine the allocation of the Indexing Vocabulary costs. The unit cost for this allocation pool is large enough to be frightening by itself, but look what happens when we allocate it. The unit cost per indexed accession to file comes down to only $0.27 which is of minor importance. This illustrates the point that high unit costs of subsidiary products can be tolerated if their volume -- hence the total dollar impact -- is small with respect to the main product line(s). This allocation also illustrates the limitation of allocations to benefitting products. Since Class C accessions are not indexed, they do not carry any of the burden of the indexing vocabulary updates.

However, a Class C accession is as likely to generate a new corporate source as is a Class A or B accession, so the Corporate Source pool is allocated (again, on the basis of volume) to all three accession classes. Here also, there is a dramatic difference between the unit cost of the pool, and the unit cost of allocation because of the relatively small volume.

If we were displaying the costs and allocations for the entire system, the top line total for the last column, Revised Total Direct, should be precisely the same

number as the top line total for the first column, Total Direct Costs, to verify the validity of the allocations.

If we were to carry these products out to the end, we would add in succeeding columns the external burdens such as general and administrative costs, marketing, and profit (or fee), with a total cost column as the last entry.

You can now see, I think, how the building block costs are arrived at. Outputs would be treated in a similar fashion, except that they are usually not quite so complicated. However, there are usually more of them. Figure 12 is a listing of possible outputs of an information system in four general classes: Publications Pages; Magnetic Tapes; Searches; and Duplication/Publication. Note that for several of these, a number of possible units are shown. This is because what you can count will depend on your system, and the way things are costed.

Now I have spent a good deal of time explaining building block cost analysis because I believe it offers the key to effective cost analysis and control for information systems -- and these are absolutely essential in today's environment. What I haven't told you -- and obviously can't in the time we have -- is how to put this to work for your system. Even if our time was unlimited, I really couldn't do that. Installing building block costing is for the foreseeable future a do-it-yourself project. Since each system is unique, the building block structure has to be designed specifically for it. There is some help available in the form of the text for the tutorial "Collecting and Reporting Real Costs of Information Systems" which was presented by the Special Interest Group on Costs, Budgeting, and Economics at the ASIS Annual Meeting in November. This text is available from ASIS headquarters at $6.00 a copy. Incidentally, I'm not plugging it for myself. ASIS gets all the income.

For most of the last 20 years, I have been hearing and reading about how impossible it is to analyze and control costs of information systems, because of their unique nature. Only in the last couple of years has the literature re-

OUTPUT PRODUCTS	UNITS
1 PUBLICATION PAGES	
a. PHOTOCOMPOSED	PAGES
b. COMPUTER-ONTO-MICROFILM	PAGES/FRAMES/FICHE
c. COMPUTER PRINTER	
(1) CAMERA READY	PAGES
(2) LISTINGS	PAGES
(a) UPPER CASE ONLY	PAGES
(b) UPPER/LOWER CASE	PAGES
OR, ALTERNATIVELY	
(a) TWO-PART	PAGES
(b) THREE-PART	PAGES
(c) ETC.	PAGES
2 MAGNETIC TAPES	
a. PUBLICATIONS FORMAT	TAPE REELS/RECORDS/CHARACTERS/PAGES
b. DATA BASE COPIES	TAPE REELS/RECORDS/CHARACTERS
c. PROGRAMS	TAPE REELS/RECORDS/CHARACTERS
3 SEARCHES	
a. CURRENT AWARENESS	HIT/PROFILE PER ACCESSION CHECKED/?
b. RETROSPECTIVE	SEARCH/HIT/PAGE
c. MANUAL	SEARCH/HOUR/?
d. PUBLICATION	SEARCH/HIT
4 DUPLICATION/PUBLICATION	
a. PLATE PREPARATION	PLATE/?
b. PRINTING	PAGE COPY/?
c. BINDING	COPY/?
d. DISTRIBUTION	COPY/ISSUE/?

FIGURE 12. OUTPUT PRODUCTS

flected any real concern with costs and efforts to analyze and control them. I am sure you will agree that we can no longer afford such superstitions.

Building block costing has been proved in actual use in real information systems. If you are going to manage an information function, I suggest you give it careful consideration.